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ABSTRACT

After two field projects, interactive videotex (IV) was introduced in West Germany in 1983. Currently, the German IV system offers over 560,000 pages of information by more than 3,400 public and private information providers. Because the potential of this medium for education seems considerable, the use of IV for educational purposes is also being explored. Information and services offered through IV include: (1) information on educational institutions and programs; (2) registration and ordering of books and learning material; (3) courses, e.g., adjunct, refresher, correspondence, and programmed learning courses; (4) individual information exchange between learners and with teachers; and (5) computer services via host computers connected to the IV system, i.e., computer assisted learning, information searching, computer-aided problem solving, computer simulation, and tests. It is assumed that IV--especially in combination with such media as private computers and videodiscs--will become a valuable medium for education. In addition, increased use of IV in the private realm of news retrieval, telebanking, and teleshopping will also have a strong impact on students' attitudes toward ordinary school instruction, which may lead to changes in the curriculum and wider adoption of IV techniques. Data tables and graphics are provided which illustrate key points in the document. (Author/JB)

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INTERACTIVE VIDEOTEX - A NEW MEDIUM FOR EDUCATION

Abstract

Interactive Videotex (IV) combines the telephone network with the home TV set. The IV subscriber has direct access to the information stored in the central post office computer or in host computers connected to the IV system at any time through his telephone line.

After two field projects IV has been introduced in West Germany in 1983 like in many other countries around the world. Currently the German IV system offers over 560,000 pages of information by more than 3,400 information providers (public and private). The use of IV for educational purposes is getting explored. The potential of this new medium for education seems considerable.

The following informations and services can be offered through IV: Information on educational institutions and programs (addresses, office hours, regulations), registration and ordering (course registration and confirmation, ordering of books and learning material), lexical information, reports and reviews (introductions, summaries, reviews), courses (adjunct courses, refresher courses, correspondence courses, programmed learning courses), individual information exchange (between learners, with teachers), computer services via host computers connected to the IV system (computer assisted learning, information search, computer-aided problem solving, computer simulation, tests).

It is assumed that IV - especially in combination with other media (private computer, video disc) - will become a valuable medium for education. Increased use of IV in the private realm (news retrieval, telebanking, teleshopping) will have a strong impact on students' attitude towards ordinary school instruction which may lead to changes in the curriculum.

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Ludwig J. ISSING

INTERACTIVE VIDEOTEX - A New Medium for Education

(A Report from West Germany)

During the last five years new telecommunication systems have been tested and are gradually being installed in almost all industrialized countries. One of these new technologies is Videotex.

1. What is Videotex?

There are two principle versions of Videotex: One is Broadcast Videotex, the other Interactive Videotex.

Broadcast Videotex (BV), also called Teletext, involves the usually wireless sending of pages of information from a TV transmitter. BV ist broadcast from a TV station during regular TV transmission in the vertical blanking interval of the TV picture.

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insert Table 1

In order to receive BV on your home TV screen your TV set needs to be equipped with a special decoder. The BV information pages are continuously broadcast one after the other. The recipient can choose the desired page from an index page by pressing the appropriate page-number-keys on his or her remonte control pad. The waiting time depends on the total number of pages broadcast. With a total number of two hundred pages broadcast it takes up to twelve seconds.

The user can hold the selected information page on the screen as long as he wishes. He also can superimpose the information page on the ongoing TV program, a technique which may be used for subtiteling movies.

BV was first developed by the BBC in 1976 as CEEFAX. In West Germany the Association of Public Broadcasting Stations has been testing BV since 1980. Presently the system offers about 200 information pages each day to more than 1 million homes over the whole country.

BV programs usually consist of national and international news, weather forecast, sports, consumer tips, a TV program guide, and the most successful service: subtiteling of TV movies, news, and sport events for users with hearing handicaps.

For educational purposes BV has some potential: For example, it can carry supplementary information to educational TV programs which may be used by teachers, depending on the level of their students. This additional information can consist of explanations of foreign words, scientific terms, or formulas which may be superimposed on the TV program or retrieved separately before or after the program. Subtiteling of foreign films using BV may prove very useful for foreign language study.

BV has a special feature: the response technique. In this technique the answer to a question does not appear on the screen until the response key on the remote control has been pressed. This technique can be used for programmed learning, for study quizzes, and for achievement testing. The student can try his own answer and compare it afterwards with the correct answer. Obviously this technique is more advantageous for individual larning at home where each student can control his own TV set. It is less useful for learning in a group.

Much more interesting for education than Broadcast Videotex, however, is Interactive Videotex.

Interactive Videotex (IV), also known as Viewdata, has its origins in research conducted by the British Post Office in the 1960s under the acronym PRESTEL. It involves the retrieving of information on an individual terminal from a central computer over telephone lines. In order to get access to IV, one needs a TV set equipped with a special decoder, a telephone line, a modulator/demodulator (modem) between the telephone and the TV set, and a remote control keypad or even better an alphanumeric key board.

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insert Table 2

IV has been introduced in more than 20 countries under various technical specifications and names like PRESTEL in Great Britain, ANTIOPE in France, TELIDON in Canada, VIEWTRON in U.S.A., and CAPTAIN in Japan.

In West Germany the PRESTEL system was adaopted and field-tested from 1980 to 1983 with more than 3,500 homes in Düsseldorf and West Berlin.

In 1984 IV (Bildschirmtext) was introduced in West Germany in a new European standard called CEPT (Conférence Européenne des Administrations des Postes et des Télécommunications).

The CEPT standard allows for higher picture resolution (11,280 dots on one page), for better graphics (90 predefined graphic signs and 94 dynamically redefinable character sets), and for more colors (32 different colors on one page). The format of the information page is 24 lines with 40 characters each.

The technical part of IV is run by the German Post Office. The IV system consists of a central post computer (IBM system 4300 and series 1 processors), regional IV computers, and the telephone network. Via telephone lines the user not only has access to the IV post computers, but also through gateway pages to external private data banks or host computers connected to the system. This gateway system is a special feature of the German IV System.

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insert Table 3

After installation of the new CEPT standard a few months ago, the German IV system has been growing slowly but gradually. The number of subscribers has grown to about 22,000 and the number of information providers to 3,470, offering about 561,000 pages of information in the post computers. At present, 70 external computer systems, e.g. mail order firms, banks, travel agencies, are accessible through Videotex. The German Post Office still expects a rapid increase of subsribers up to 4 million and an increase of information providers up to 60,000 by 1990.

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insert Table 4

Many experts doubt whether these expectations are realistic. But if the expected figures are met only halfway IV will become a powerful information retrieval system.

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insert Table 5

The information offered in the German IV system is structured hierarchically and listed in menu form. The user can get to the stored information by one of four ways:

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insert Table 6

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2. What is the Potential of Interactive Videotex for Education?

If we search under the category "Education and Science" we find about 140 related key words listed. If we press the number attached to the selected key word we find all information providers listed who offer information pages related to that key word. The the user is left to check the program of each information provider listed under the key word until he finds the information he was heading for. Since it is the information provider's job to define under which key words his information program is listed, these connections quite often are erroneous and lead to frustration. This shortcoming of the IV system can only be overcome by information broker services which provide screened access to program parts related to specific content areas or key words.

In the area of Education and Science at present, there are about 250 information providers active with about 24,000 information pages; this accounts for a little over 4% of the total number of pages offered in the system. However, there are indications that very soon a considerable number of educational institutions will joint the IV system. Currently, education-related information pages are offered by the following categories of information providers:

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insert Table 7

What education-related contents and services can be offered through IV? The potential is considerable:

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insert Table 8

Very interesting is the IV personal correspondence service which operates as an electronic mail service. With this, each IV participant can send personal news to any other IV user. Educators could use this technique for ordering forms, books, and audiovisual media, or it could be used by students for questions to the teacher and for an information exchange between the (individual) learners.

It should be noted that IV information pages can be coded by the information provider so that this information in the Central Computer is only accessible for specifically registered users. This service for Closed User Groups is particularly useful for fast information distribution, for continuing education, or for specific instruction for certain vocations, e.g. physicians.

IV has its advantages for fast dissemination of up-to-date information. For learning and science it is particularly valuable as an easy to use access medium to external computers and data banks. The German Open University of Hagen is the first education institution to use the gateway system. Its students have direct access via IV to the university's computer system. In this way the students of the correspondence courses can reach a large data bank from their homes making the following services accessible:

1) computer-aided study information
2) registering for courses with immediate confirmation
3) ordering books and learning material
4) computer-aided learning
5) tests
6) problem solving
7) simulation

About 60 universities in West Germany are using or planning to use IV in the near future, mainly for providing easily accessible information to students on registration procedures as well as information on course programs, and also for distributing research information to industry.

The German Government is supporting a number of field experiments in order to explore how IV can successfully be used in schools.

The probable uses of IV in schools can be summarized as follows:

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insert Table 9

There is some agreement among media specialists that IV is excellent as an up-to-date reference medium or as a gateway system to large data banks and to computer centers; but only in combination with home and microcomputers is IV suitable for intelligent computer-aided learning.

In combination with intelligent video disc equipment IV becomes an ideal medium for task-oriented self-paced audio-visual learning. This means that in addition to his

IV terminal the educationally inclined user needs to spend a considerable amount of money on extra equipment.

Finally, IV, because of its limitation to textual and graphic information, seems to be a medium in transition which in about 10 years will merge with other on-line computerized services providing moving pictures in full color and in high picture resolution (Broadband Interactive Cable Services).

Today IV is a timely step towards that future.

3. What Impact will IV have on Education?

On the use of IV in educat ion we have made an intensive investigation with IV users in West Berlin. We found that there is a strong interest in up-to-date educational news, in lexical information, in services like registering for courses and ordering books, in handy information on everyday problems, as well as in short interactive courses. The interviewees felt that in IV there is a lack of personal contact with the teacher and with other students. But they felt that this could be coped with trough occasional personal contacts in seminar-like meetings.

The reading of IV text pages takes about a third more time than reading the same information in a book, and it is more exhausting. Therefore IV will not be able to replace the book even if its pictorial quality is improved. Nevertheless, a high acceptance of IV can be expected, particularly in the field of private continuing education and in vocational training. The users apparently are willing to pay fees for educational IV programs: they compare the IV page fees to the price of page in a book.

In the opinion of our interviewees IV as a medium will become more important in institutions of higher learning and in inservice training than in schools, because IV is an individual medium and not very effective for group learning. In schools, therefore, IV will mainly play a supplementary role as a source of reference and as a tool for remedial learning.

The indirect impact of IV on the school will be much stronger. The information-seeking behavior and the learning motivation of the students in general will be fundamentally changed because of increased use of IV in the private realm. Since through IV knowledge of any kind can be retrieved electronically at any time, the motivation to memorize data will decrease strongly, while search strategies, the ordering of information, and competence in using a computer-based system as a working tool will become most important.

4. What Impacts will IV have on the Personal Realm and on Social Life?

When IV users were asked which attributes they liked best in IV, the following responses were received:

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insert Table 10

IV is normally used alone without a partner. It is used mainly while one would watch television. But still IV users believed that due to using IV they communicate about 5% less with their family than before. And, if the family had only one TV set or only one telephone line, quarrels developed in the family about IV use.

The users believe that IV leads to being better informed on cultural and political events, and that it particularly saves time through tele-banking, tele-shopping, and tele-visits to official offices. That raises the question as to whether social contacts are being reduced. IV users do not believe this. They believe that through IV one can actually make new personal contacts, (e.g. there are ads in IV for making new acquaintances).

Today only 23% of the German population is interested in IV. The highest interest is in the business sector. People interested in IV can be characterized as individuals with higher education and with technical interests between the ages of 30 and 40. And this is true of men in these groups much more than of women.

In 1983 at the Freie Universität Berlin we investigated the opinions of education, psychology, and journalism students on the new technologies, especially on Cable Television and Videotex.

Of the students questionned 60% had a negative attitude towards the new media. They grounded their rejection mainly on the four following apprehensions:

1. They fear an increase of political and economic influence on the individual through the new media partly because they believe that the new media lead to greater monopoly in the media field by powerful companies.

2. They fear a decrease of direct social communication through tele-shopping, tele-banking, etc., and through this an increase of anonymity in society.

3. They fear that the new media will lead to a further computerization in many professions, thus causing many jobs to be lost. The number of new jobs created by the new media might be fewer in comparison.

4. They fear that automatic recording and analysis of media consumption behavior could lead to an increase in control over private life.

   One could add an additional fear:

5. In the long run the use of computerized information systems will have major effects on our way of thinking and on our way of experiencing the world.

These are negative aspects of IV and other computer technologies which we as educational technologists should not neglect.

But how should educators react towards the introduction of new communication technologies like IV? Should they try to reject it? It appears to me that a forward or positive strategy is much more promising: The advantages of the new media should be used as far as possible for the goals of education. This will be possible only if educators engage themselves in the ongoing development of these new technologies, rather than leave this field to industry, commerce or politics.

Furthermore media education and media literacy should be intensified in the curriculum. Current media research indicates that the main defining factor of future media behavior is a person's educational level. Therefore, teachers, parents, and finally, the children must learn to handle the telecommunication media as tools, which then can be exploited for their personal needs and interests as well as for public improvement. Active media education will be one of the main tasks for the home and the school for the coming decades. These goals will be reached only if teachers and parents themselves show a positive modelling behavior.

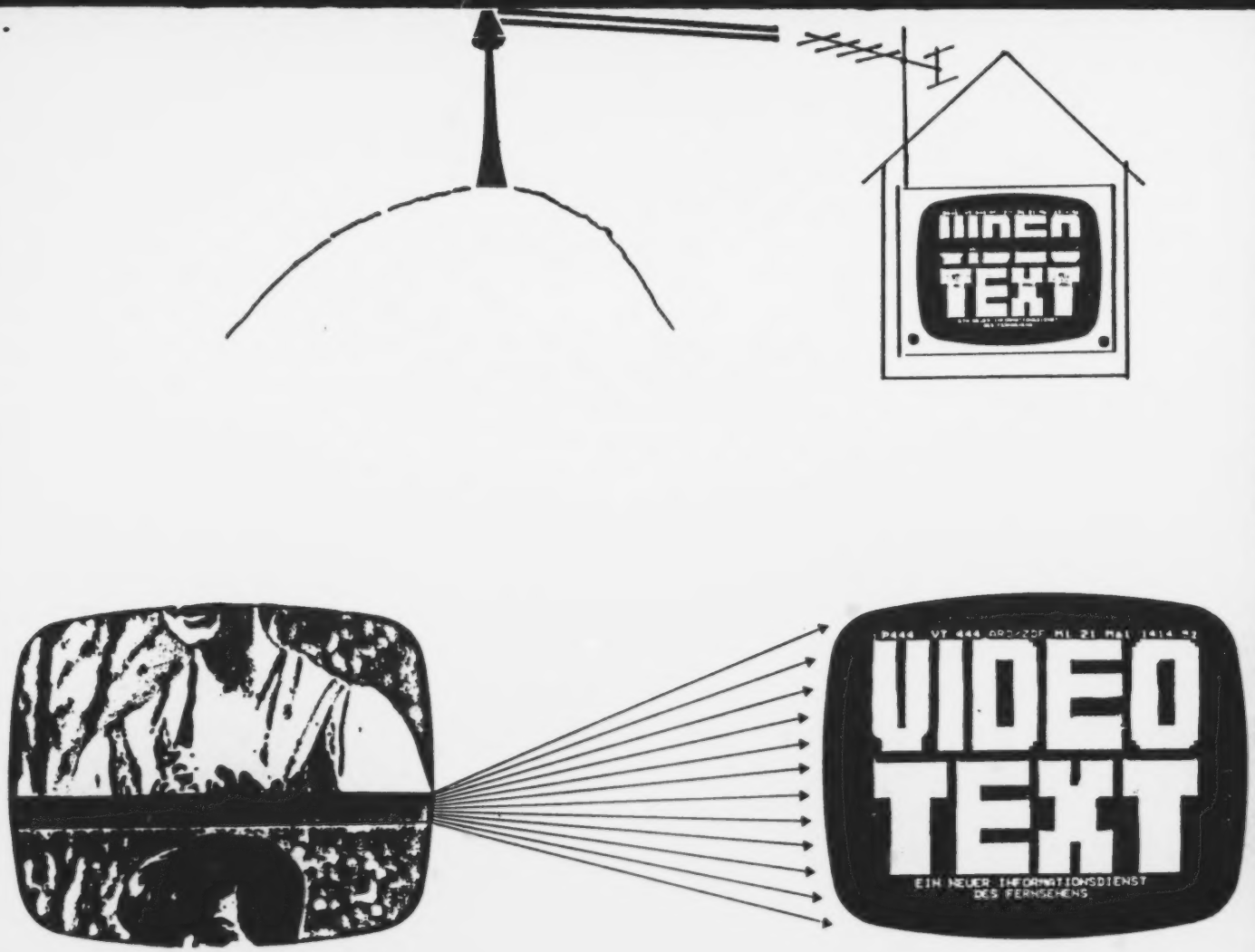

Table 1: Broadcast Videotex:
Sending of information pages from a TV transmitter during regular TV program transmission in the blanking interval of a TV picture

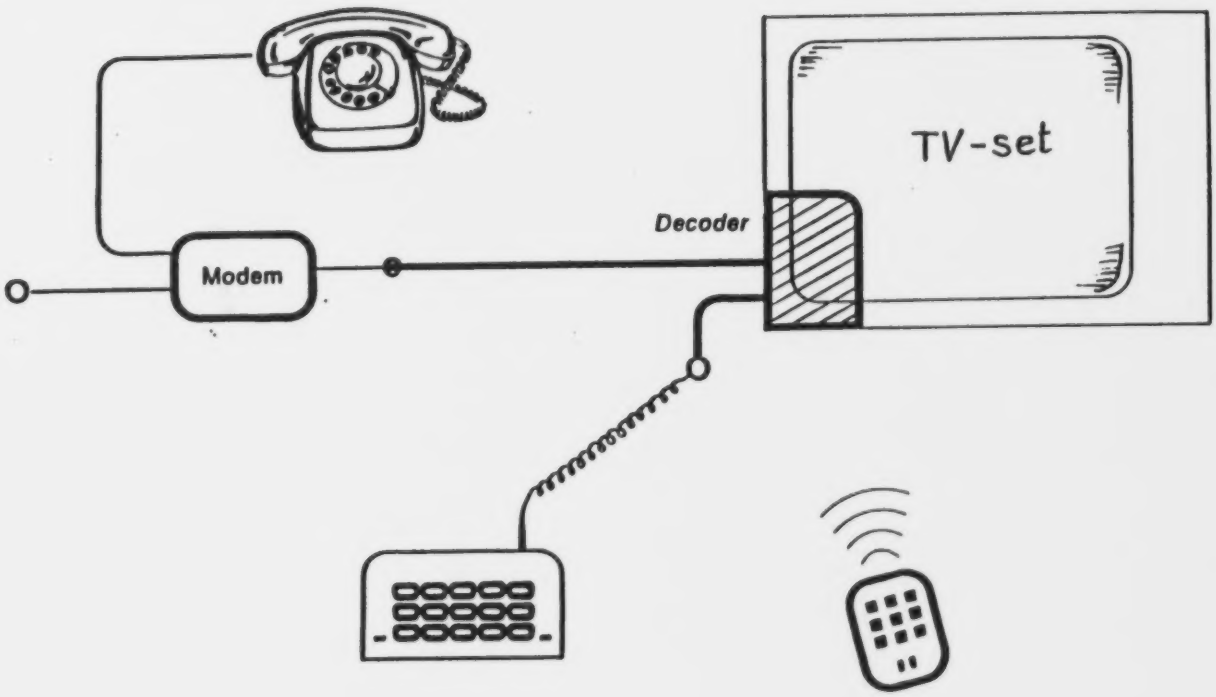

Table 2: INTERACTIVE VIDEOTEX ("BILDSCHIRMTEXT")

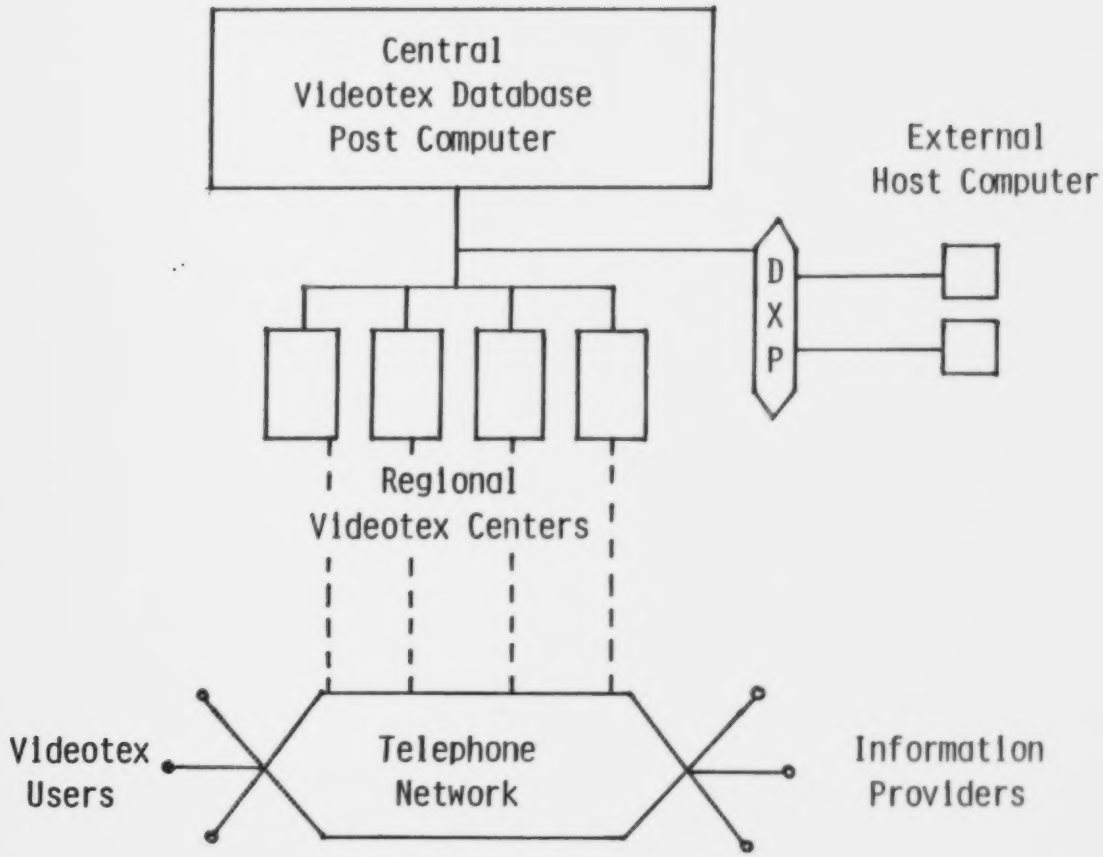

Table 3 : The Interactive Videotex System in West Germany

	February 25, 1985
Subscribers	21,959
Information providers	3,470
Information pages	561,600
External host computer centers	70

Table 4: Statistics of BILDSCHIRMTEXT

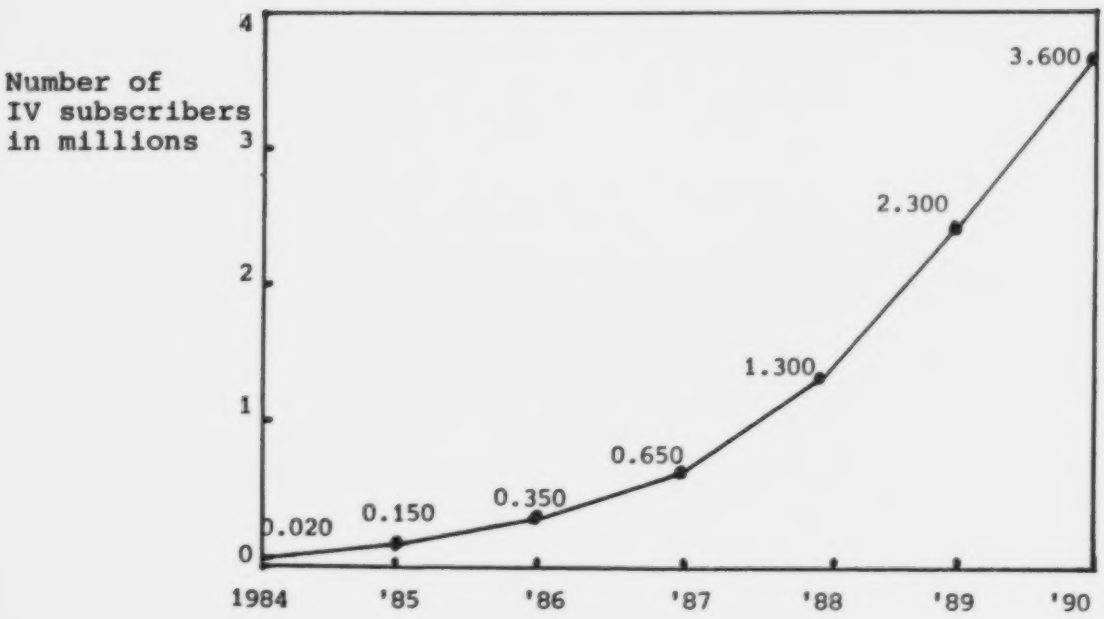

Table 5: Growth rate of subscribers to the German BILDSCHIRMTEXT System (Interactive Videotex) as expected by the Deutsche Bundespost.

- via alphabetical index of information providers

- via alphabetical index of key words

- via alphabetical index of content areas

- via direct input of known page numbers

Table 6: Access to information in the German Interactive Videotex System

Information providers in the area of Education and Science	Percentage of all Education related pages
Public Institutions Government Offices, Communities, Churches	27,5 %
Media Producers News agencies, Broadcasting Stations, Newspapers	20,0 %
Educational Institutions Colleges, Universities, Institutions of Vocational Training and Continuing Education, Correspondence Schools etc.	21,0 %
Associations, Political Parties	15,5 %
Business, Agencies Data Banks, Consulting Firms	12,5 %
Trade and Commerce	2,5 %
Private Information Providers	1,0 %
	100,0 %

Table 7: Categories of information providers for education and science in the German Interactive Videotex System.

INFORMATION ON EXTERNAL EDUCATIONAL PROGRAMS AND INSTITUTIONS
(Adresses, Office Hours, Fees, Regulations)

REGISTRATION AND ORDERING
(Course Registration with Confirmation, Ordering of Books and Learning Material)

LEXICAL INFORMATION

REPORTS AND REVIEWS
(Introduction, Summaries, Literature Reviews)

COURSES
(Adjunct Courses, Refresher Courses, Correspondence Courses, Programmed Learning)

COMPUTER SERVICES (ACCESS TO EXTERNAL HOST COMPUTERS)
(Computer-Assisted Learning, Information Search, Computer-Aided Problem Solving, Computer Simulation, Tests)

CORRESPONDENCE SERVICE (ELECTRONIC MAIL)
(Information Exchange with Teachers, with other Learners)

Table 8 : Educational information categories and services possible in Interactive Videotex

- for ordering written information material, books, and audiovisual media

- for instant dissemination of administrative information to teachers, parents,and students

- for instant feedback messages to the school and for person-to-person correspondence

- for acquainting the students with an information retrieval system

- for retrieving up-to-date information needed in the actual learning situation

- for problem solving and simulation learning

- for transferring tele-software from data banks to be used on private computers

- for developing and designing information pages

Table 9: Probable uses of Interactive Videotex in schools

- the information is available at any time of the day	8 %
- one has quick and easy access to many kinds of information	31 %
- the system is interactive (one can do tele-banking and tele-shopping from the living room and one can send messages)	61 %
	100 %

Table 10: Advantages of Interactive Videotex as appreciated by subscribers in West Berlin